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DB=USPT; PLUR=NO; OP=OR

L43	(l39 or l40 or l41 or l42) and (b adj1 tree)	47	L43
L42	L38 and (column\$ same (boolean adj1 operator))	5	L42
L41	L38 and (column\$ same (greater and less and equal))	44	L41
L40	L38 and ((search\$ or quer\$) same greater and less and equal)	88	L40
L39	L38 and ((search\$ or quer\$) same boolean)	56	L39
L38	(l36 or l37) and (index\$ same database same column\$)	362	L38
L37	((707/100)!.CCLS.)	1342	L37
L36	((707/1 707/2 707/3)!.CCLS.)	4094	L36
L35	L34 and (column same row\$ same (text or word\$))	13	L35
L34	L33 and (column\$ and table\$)	38	L34
L33	L32 and index\$	41	L33
L32	L31 and (user adj1 interfac\$)	46	L32
L31	L1 and (database adj1 management)	157	L31
L30	L29 and (column\$ same signature)	3	L30
L29	index\$.ti.	4009	L29
L28	L17 and (column same signature)	0	L28
L27	L17 and (column same multimedia)	1	L27
L26	L17 and pars\$	13	L26
L25	L17 and ((invert\$ adj1 index) same pars\$)	2	L25
L24	L23 and pars\$	0	L24
L23	6349308.pn.	1	L23
L22	L20 and table	7	L22
L21	L20 and table	7	L21
L20	L17 and (invert\$ adj1 index)	7	L20
L19	L17 and ((search\$ or quer\$) same (greater or less or equal))	31	L19
L18	L17 and (column\$ same boolean)	7	L18
L17	L1 and index\$.ti.	53	L17
L16	L14 and index\$.ti.	26	L16
L15	L1 and (greater adj1 than)	0	L15
L14	L13 and less	111	L14
L13	L1 and greater	159	L13
L12	L11 and (search\$ or quer\$)	16	L12
L11	L9 and L8	16	L11

091 928,894

L10	L1 and (equal\$ adj1 condition\$)	2	L10
L9	L1 and (boolean adj1 operator\$)	21	L9
L8	L1 and (index\$ same column\$ same database\$)	126	L8
L7	L1 and (index\$ same column\$)	162	L7
L6	L1 and (column\$ same database)	187	L6
L5	(unstructured adj1 column\$)	2	L5
L4	(unstructured near column\$)	2	L4
L3	((unstructured near column\$) same database)	0	L3
L2	L1 and (unstructured near column\$)	0	L2

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Best 200 shown

Relevance scale ☐ ☐ ☐ ☐ ☐**1** [Improved query performance with variant indexes](#)

Patrick O'Neil, Dallan Quass

 June 1997 **ACM SIGMOD Record , Proceedings of the 1997 ACM SIGMOD international conference on Management of data**, Volume 26 Issue 2
Full text available: [pdf\(1.54 MB\)](#)
 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The read-mostly environment of data warehousing makes it possible to use more complex indexes to speed up queries than in situations where concurrent updates are present. The current paper presents a short review of current indexing technology, including row-set representation by Bitmaps, and then introduces two approaches we call Bit-Sliced indexing and Projection indexing. A Projection index materializes all values of a column in RID order, and a Bit-Sliced index essentially takes an orth ...

2 [Query processing and optimization in Oracle Rdb](#)

Gennady Antoshenkov, Mohamed Ziauddin

 December 1996 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 5 Issue 4
Full text available: [pdf\(92.62 KB\)](#)
 Additional Information: [full citation](#), [abstract](#), [index terms](#)

This paper contains an overview of the technology used in the query processing and optimization component of Oracle Rdb, a relational database management system originally developed by Digital Equipment Corporation and now under development by Oracle Corporation. Oracle Rdb is a production system that supports the most demanding database applications, runs on multiple platforms and in a variety of environments.

Keywords: Dynamic optimization, Optimizer, Query transformation, Relational database, Sampling

3 [Bit-sliced index arithmetic](#)

Denis Rinfret, Patrick O'Neil, Elizabeth O'Neil

 May 2001 **ACM SIGMOD Record , Proceedings of the 2001 ACM SIGMOD international conference on Management of data**, Volume 30 Issue 2
Full text available: [pdf\(182.64 KB\)](#)
 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The bit-sliced index (*BSI*) was originally defined in [ONQ97]. The current paper introduces

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the concept of BSI arithmetic. For any two BSI's X and Y on a table T , we show how to efficiently generate new BSI's Z , V , and W , such that $Z = X + Y$, $V = X - Y$, and $W = \text{MIN}(X, Y)$; this means that if a row r in T has a value x represented in BSI X and a value y in BSI Y , the value for r in BSI Z will be $x + y$, the value in V will be $x - y$ and the value in W will be $\text{MIN}(x, y)$. Since a bitmap repre ...

4 AutoAdmin "what-if" index analysis utility

Surajit Chaudhuri, Vivek Narasayya

June 1998 **ACM SIGMOD Record , Proceedings of the 1998 ACM SIGMOD international conference on Management of data**, Volume 27 Issue 2

Full text available:  pdf(1.52 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As databases get widely deployed, it becomes increasingly important to reduce the overhead of database administration. An important aspect of data administration that critically influences performance is the ability to select indexes for a database. In order to decide the right indexes for a database, it is crucial for the database administrator (DBA) to be able to perform a quantitative analysis of the existing indexes. Furthermore, the DBA should have the ability to propo ...

5 On supporting containment queries in relational database management systems

Chun Zhang, Jeffrey Naughton, David DeWitt, Qiong Luo, Guy Lohman

May 2001 **ACM SIGMOD Record , Proceedings of the 2001 ACM SIGMOD international conference on Management of data**, Volume 30 Issue 2

Full text available:  pdf(223.70 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Virtually all proposals for querying XML include a class of query we term "containment queries". It is also clear that in the foreseeable future, a substantial amount of XML data will be stored in relational database systems. This raises the question of how to support these containment queries. The inverted list technology that underlies much of Information Retrieval is well-suited to these queries, but should we implement this technology (a) in a separate loosely-coupled IR engine ...

6 Query processing: Factorizing complex predicates in queries to exploit indexes

Surajit Chaudhuri, Prasanna Ganesan, Sunita Sarawagi

June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on on Management of data**

Full text available:  pdf(240.56 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Decision-support applications generate queries with complex predicates. We show how the *factorization* of complex query expressions exposes significant opportunities for exploiting available indexes. We also present a novel idea of relaxing predicates in a complex condition to create possibilities for factoring. Our algorithms are designed for easy integration with existing query optimizers and support multiple optimization levels, providing different trade-offs between plan complexity and ...

7 Query Optimization in Database Systems

Matthias Jarke, Jurgen Koch

June 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 2

Full text available:  pdf(2.84 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 XPS a database server for data warehousing

Andreas Weininger

November 2001 **Proceedings of the 4th ACM international workshop on Data**

warehousing and OLAPFull text available: [pdf\(621.63 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

A database server used for implementing a data warehouse must support other features than a database server used for OLTP. Therefore, in this paper we will look specifically at features necessary for efficiently processing queries on a database with a star schema model, a database scheme which is used very often in data warehousing. We will especially analyze the features provided for this by the IBM Extended Parallel Server (XPS). There are special star join methods like the Push-Down Hash Semi ...

9 Reusing invariants: a new strategy for correlated queries

Jun Rao, Kenneth A. Ross

June 1998 **ACM SIGMOD Record , Proceedings of the 1998 ACM SIGMOD international conference on Management of data**, Volume 27 Issue 2Full text available: [pdf\(1.55 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Correlated queries are very common and important in decision support systems. Traditional nested iteration evaluation methods for such queries can be very time consuming. When they apply, query rewriting techniques have been shown to be much more efficient. But query rewriting is not always possible. When query rewriting does not apply, can we do something better than the traditional nested iteration methods? In this paper, we propose a new invariant technique to evaluate correlated queries ...

10 Strategies for processing ad hoc queries on large data warehouses

Kurt Stockinger, Kesheng Wu, Arie Shoshani

November 2002 **Proceedings of the 5th ACM international workshop on Data Warehousing and OLAP**Full text available: [pdf\(245.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As data warehousing applications grow in size, existing data organizations and access strategies, such as relational tables and B-tree indexes, are becoming increasingly ineffective. The two primary reasons for this are that these datasets involve many attributes and the queries on the data usually involve conditions on small subsets of the attributes. Two strategies are known to address these difficulties well, namely vertical partitioning and bitmap indexes. In this paper, we summarize our exp ...

11 Data structures for efficient broker implementation

Anthony Tomasic, Luis Gravano, Calvin Lue, Peter Schwarz, Laura Haas

July 1997 **ACM Transactions on Information Systems (TOIS)**, Volume 15 Issue 3Full text available: [pdf\(316.45 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

With the profusion of text databases on the Internet, it is becoming increasingly hard to find the most useful databases for a given query. To attack this problem, several existing and proposed systems employ brokers to direct user queries, using a local database of summary information about the available databases. This summary information must effectively distinguish relevant databases and must be compact while allowing efficient access. We offer evidence that one broker, GIOSS

Keywords: GIOSS, broker architecture, broker performance, distributed information, grid files, partitioned hashing

12 Extensions to Starburst: objects, types, functions, and rules

Guy M. Lohman, Bruce Lindsay, Hamid Pirahesh, K. Bernhard Schiefer

October 1991 **Communications of the ACM**, Volume 34 Issue 10

Full text available: [pdf\(5.21 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Extended relational database management systems, Starburst, extensible database management systems

13 Performance comparison of property map and bitmap indexing

Ashima Gupta, Karen C. Davis, Jennifer Grommon-Litton

November 2002 **Proceedings of the 5th ACM international workshop on Data Warehousing and OLAP**

Full text available: [pdf\(250.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A data warehouse is a collection of data from different sources that supports analytical querying. A Bitmap Index (BI) allows fast access to individual attribute values that are needed to answer a query by representing the values of an attribute for all tuples separately, as bit strings. A Property Map (PMap) is a multidimensional indexing technique that pre-computes attribute expressions, called properties, for each tuple and stores the results as bit strings [DD97, LD02]. This paper compares t ...

Keywords: bitmap index, data warehouse, performance study

14 Similarity queries I: Robust and efficient fuzzy match for online data cleaning

Surajit Chaudhuri, Kris Ganjam, Venkatesh Ganti, Rajeev Motwani

June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

Full text available: [pdf\(271.47 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

To ensure high data quality, data warehouses must validate and cleanse incoming data tuples from external sources. In many situations, clean tuples must match acceptable tuples in *reference tables*. For example, product name and description fields in a sales record from a distributor must match the pre-recorded name and description fields in a product reference relation. A significant challenge in such a scenario is to implement an efficient and accurate fuzzy match operation that can effec ...

15 Special issue on prototypes of deductive database systems: The aditi deductive database system

Jayen Vaghani, Kotagiri Ramamohanarao, David B. Kemp, Zoltan Somogyi, Peter J. Stuckey, Tim S. Leask, James Harland

April 1994 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 3 Issue 2

Full text available: [pdf\(2.67 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Deductive databases generalize relational databases by providing support for recursive views and non-atomic data. Aditi is a deductive system based on the client-server model; it is inherently multi-user and capable of exploiting parallelism on shared-memory multiprocessors. The back-end uses relational technology for efficiency in the management of disk-based data and uses optimization algorithms especially developed for the bottom-up evaluation of logical queries involving recursion. The front ...

Keywords: implementation, logic, multi-user, parallelism, relational database

16 Heuristic optimization of OLAP queries in multidimensionally hierarchically clustered databases

Dimitri Theodoratos, Aris Tsois

November 2001 **Proceedings of the 4th ACM international workshop on Data warehousing and OLAP**


Full text available:  pdf(1.44 MB) Additional Information: [full citation](#), [abstract](#), [citations](#)

On-line analytical processing (OLAP) is a technology that encompasses applications requiring a multidimensional and hierarchical view of data. OLAP applications often require fast response time to complex grouping/aggregation queries on enormous quantities of data. Commercial relational database management systems use mainly multiple one-dimensional indexes to process OLAP queries that restrict multiple dimensions. However, in many cases, multidimensional access methods outperform one-dimensiona ...

17 Tutorial: The relational data model for Design Automation

Mark N. Haynie

June 1983 **Proceedings of the twentieth design automation conference on Design automation**

Full text available:  pdf(767.27 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The relational data model has gained more acceptance in the commercial database environment in recent years. It is now finding its way into the Design Automation (CAD/CAM) area. This tutorial explains what the relational data model is and how database management systems based on it can be used with Design Automation applications.

18 Data access for the masses through OLE DB

José A. Blakeley

June 1996 **ACM SIGMOD Record , Proceedings of the 1996 ACM SIGMOD international conference on Management of data**, Volume 25 Issue 2

Full text available:  pdf(1.24 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of OLE DB, a set of interfaces being developed at Microsoft whose goal is to enable applications to have uniform access to data stored in DBMS and non-DBMS information containers. Applications will be able to take advantage of the benefits of database technology without having to transfer data from its place of origin to a DBMS. Our approach consists of defining an open, extensible Collection of interfaces that factor and encapsulate orthogonal, reusable portions ...

19 The Quadtree and Related Hierarchical Data Structures

Hanan Samet

June 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 2

Full text available:  pdf(4.87 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

20 Industrial sessions: commercial implementation techniques: A compact B-tree

Peter Bumbulis, Ivan T. Bowman

June 2002 **Proceedings of the 2002 ACM SIGMOD international conference on Management of data**

Full text available:  pdf(825.30 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we describe a Patricia tree-based B-tree variant suitable for OLTP. In this variant, each page of the B-tree contains a local Patricia tree instead of the usual sorted array of keys. It has been implemented in iAnywhere ASA Version 8.0. Preliminary experience has shown that these indexes can provide significant space and performance benefits over existing ASA indexes.

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